

하은희 기생충 AI 문제 답

2025. 12. 15.

각 조별로 아래 두 문항을 해결하고 각자 최소 하나의 문항을 해결한 답을 각자 notion 에 올리시오.

선택 문항: 문항 1 번

- Malaria 감염 RBC 와 비감염 RBC 사진을 [Malaria Cell Images Dataset](https://www.kaggle.com/datasets/iarunava/cell-images-for-detecting-malaria/data) <https://www.kaggle.com/datasets/iarunava/cell-images-for-detecting-malaria/data> 에서 내려 받아, 이미지 분류 CNN 을 설계해 감염비감염 적혈구를 구분하는 모델을 만들고 모델의 성능을 평가한 보고서를 작성하시어 각자 노선에 올리시오.

참고문헌 > <https://pmc.ncbi.nlm.nih.gov/articles/PMC12629934/#S2>


이 보고서에서 2 가지 버전 ((1) Teachable Machine 그리고 (2) Vibe Coding)을 이용하여 선택 문항 1 번 모델을 만들었습니다.

(1) Teachable Machine 을 활용한 이미지 분류

[Image Model - Teachable Machines](#) 를 사용하여 이미지 분류를 실행했습니다.

모델이 얼마나 잘 작동하는지 파악하는 데 도움이 되는 몇 가지 그래프입니다.

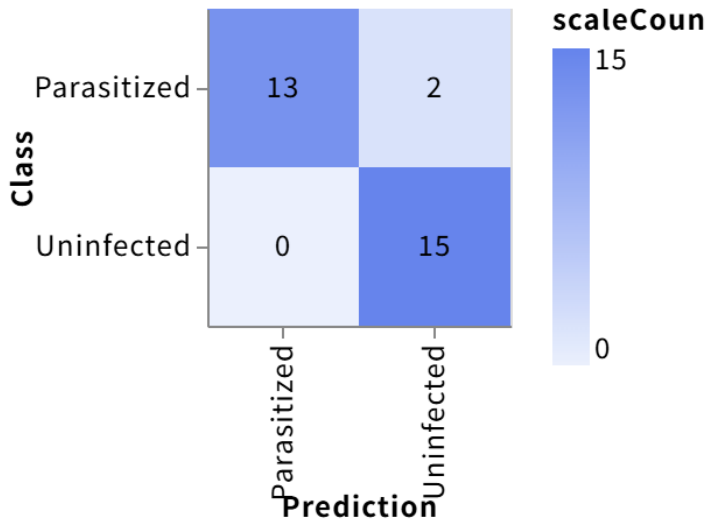
처음에는 이해가 되지 않아도 걱정하지 마세요. Teachable Machine을 사용하는 데는 이 그래프가 필요하지 않습니다. 사실 대부분의 사람들은 그래프를 굳이 사용하지 않습니다. :)

어휘 

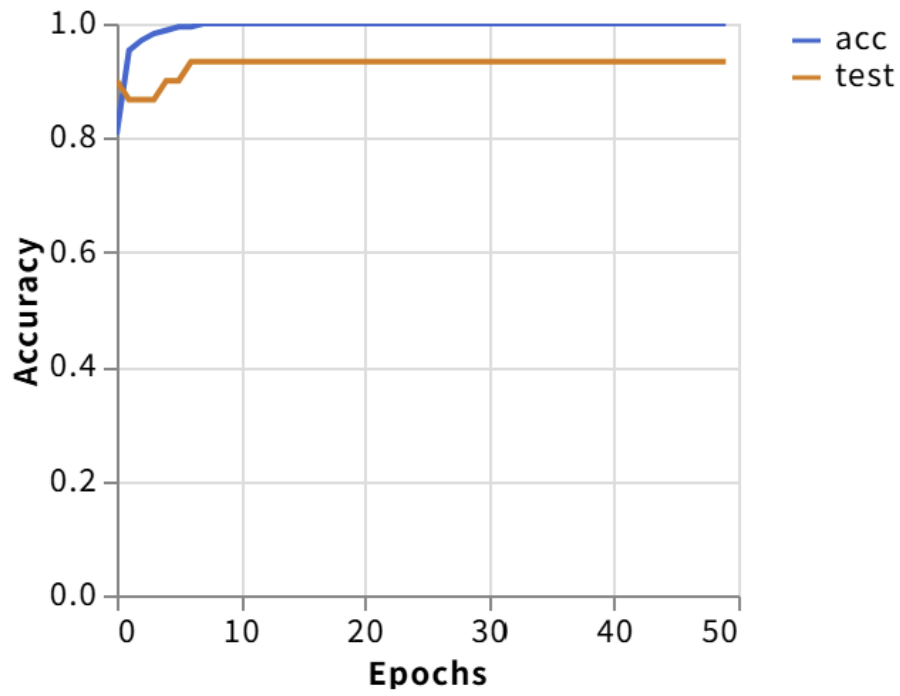
클래스별 정확도 

CLASS	ACCURACY	# SAMPLES
Parasitized	0.87	15
Uninfected	1.00	15

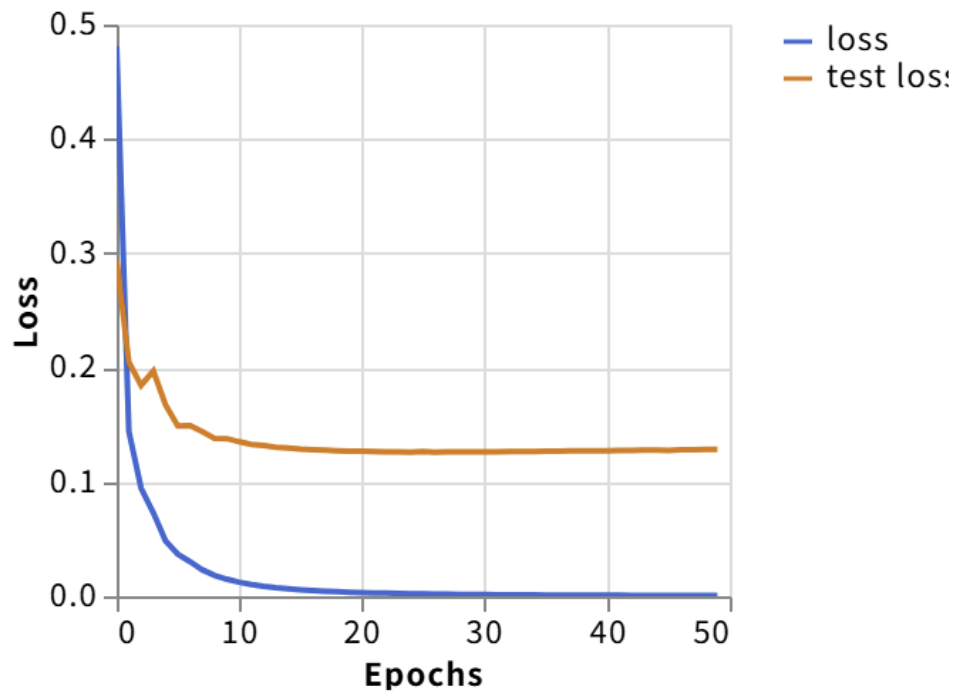
혼동 행렬 



에포크별 정확도



에포크별 손실



Test (Parasitized Test Image)

The screenshot shows the Teachable Machine interface. On the left, there are two image galleries: "Parasitized" and "Uninfected", each containing 100 image samples. The "Parasitized" gallery shows images with a purple spot, while the "Uninfected" gallery shows plain brown images. A "클래스 추가" (Add Class) button is visible below the galleries. In the center, the "학습" (Learn) panel shows settings: "고급" (Advanced) mode, "에포크: 50", "배치 크기: 16", and "학습률: 0.001". On the right, the "미리보기" (Preview) panel shows a "모델 내보내기" (Export Model) button, instructions for uploading images, a "Google Drive에서 이미지 가져오기" (Get Images from Google Drive) button, and a preview image of a parasitized test image. Below the preview, there are progress bars for "출력" (Output): "Parasi..." is at 100% and "Uninf..." is at 0%.

Test (Uninfected Test Image)

The screenshot shows the Teachable Machine interface. On the left, there are two image galleries: "Parasitized" and "Uninfected", each containing 100 image samples. The "Uninfected" gallery shows plain brown images, while the "Parasitized" gallery shows images with a purple spot. A "클래스 추가" (Add Class) button is visible below the galleries. In the center, the "학습" (Learn) panel shows settings: "고급" (Advanced) mode, "에포크: 50", "배치 크기: 16", and "학습률: 0.001". On the right, the "미리보기" (Preview) panel shows a "모델 내보내기" (Export Model) button, instructions for uploading images, a "Google Drive에서 이미지 가져오기" (Get Images from Google Drive) button, and a preview image of an uninfected test image. Below the preview, there are progress bars for "출력" (Output): "Parasi..." is at 0% and "Uninf..." is at 99%.

AI Colab Result (모델의 성능을 평가한 보고서)

<https://colab.research.google.com/drive/1QglDN1QipXbNsAywIqb2v2-aadjnvlz?usp=sharing>

사용한 Test Image (test_images.zip)와 모델 (converted_tflite.zip)

[test_images.zip](#)

[converted_tflite.zip](#)

(2) Vide Coding 을 이용한 분류

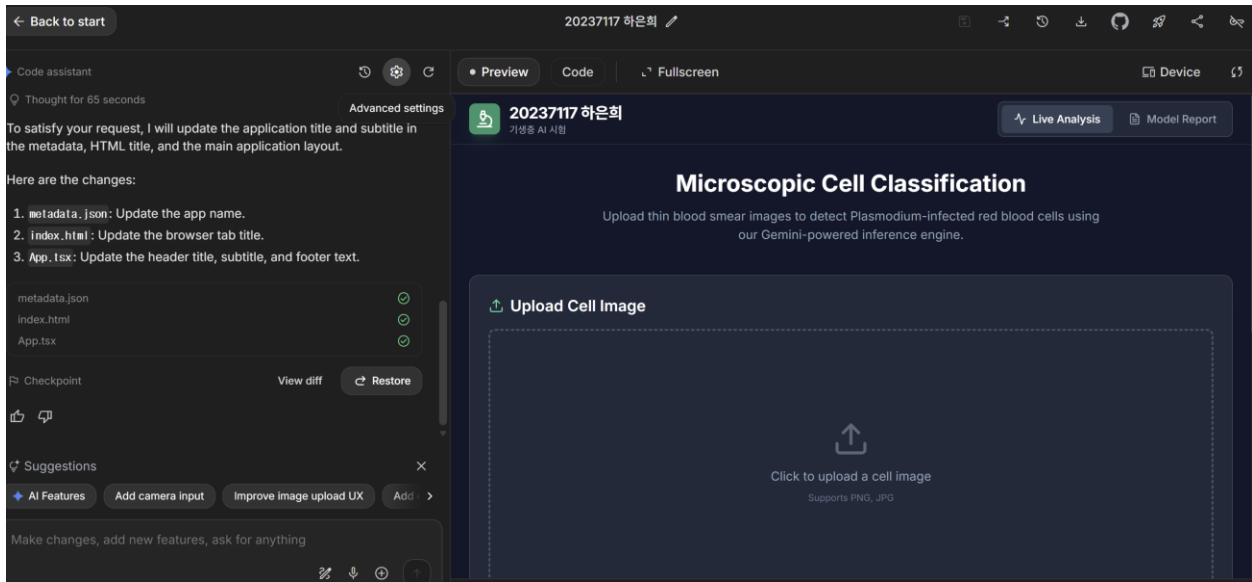
aistudio.google.com 를 활용하여 Parasite 와 uninfected 를 분류하는 모델을 만들었습니다.

User Prompt: **“**<https://www.kaggle.com/datasets/iarunava/cell-images-for-detecting-malaria/data>**** 이미지 분류 CNN 을 설계해 감염비감염 적혈구를 구분하는 모델을 만들고 모델의 성능을 평가한 보고서를 작성해줘.”

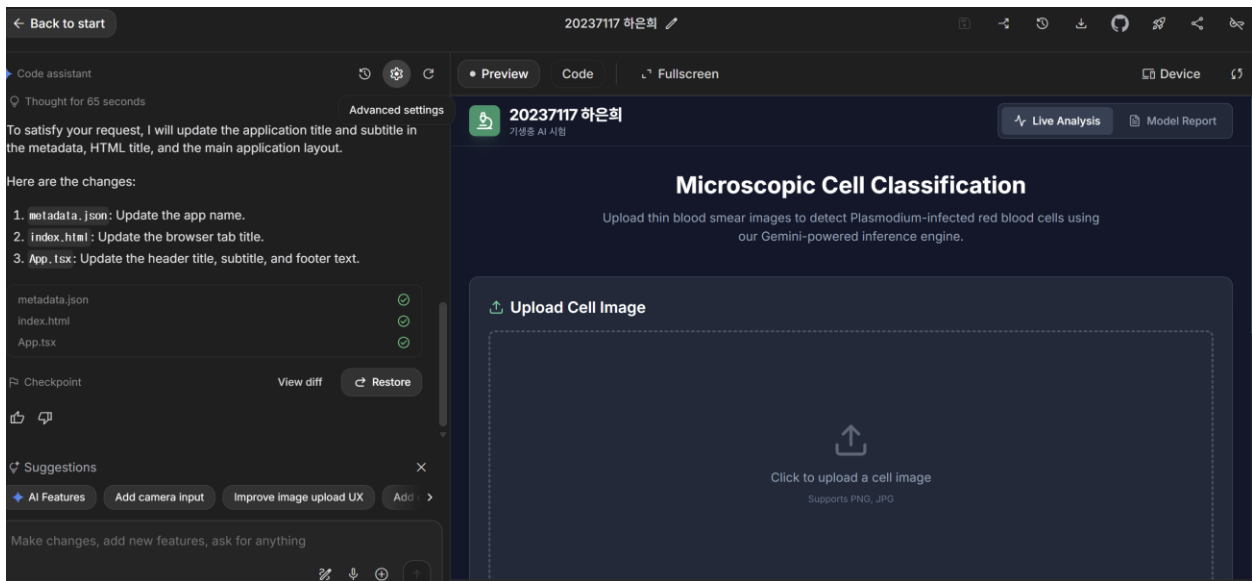
생성모델:

<https://ai.studio/apps/drive/1S4y1SMiwQXDSmqUQfpm1w-sLDA7FvuEY?fullscreenApplet=true>

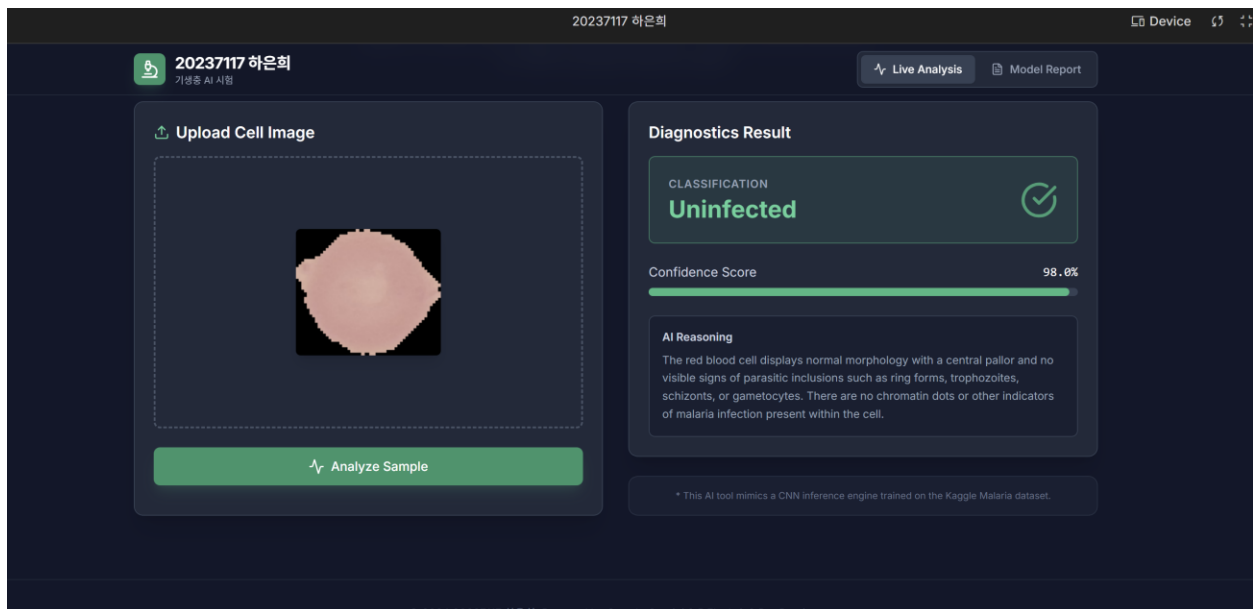
[https://aistudio.google.com/app/prompts?state={"ids":\["1S4y1SMiwQXDSmqUQfpm1w-sLDA7FvuEY"\],"action":"open","userId":"117329364207480471566","resourceKeys":{}}&usp=sharing](https://aistudio.google.com/app/prompts?state={)



Test (Parasite Sample)



Test (Uninfected Sample)



AI Studio Code:

```
import React, { useState } from 'react';
import { AppMode } from './types';

import { ImageAnalyzer } from './components/ImageAnalyzer';
import { ReportGenerator } from './components/ReportGenerator';
import { Microscope, FileText, Activity } from 'lucide-react';

const App: React.FC = () => {
  const [mode, setMode] = useState<AppMode>(AppMode.ANALYSIS);

  return (
    <div className="min-h-screen bg-slate-900 text-slate-200 selection:bg-emerald-500/30 pb-12">
      { /* Header */ }
      <header className="bg-slate-900 border-b border-slate-800 sticky top-0 z-50 backdrop-blur-md bg-opacity-80">
        <div className="max-w-7xl mx-auto px-4 sm:px-6 lg:px-8 h-16 flex items-center justify-
```

between">

```
<div className="flex items-center gap-3">
```

```
  <div className="w-10 h-10 bg-emerald-600 rounded-lg flex items-center justify-center shadow-lg shadow-emerald-600/20">
```

```
    <Microscope className="text-white w-6 h-6" />
```

```
  </div>
```

```
<div>
```

```
  <h1 className="text-xl font-bold text-white tracking-tight">20237117 하은희</h1>
```

```
  <p className="text-xs text-slate-400">기생충 AI 시험</p>
```

```
</div>
```

```
</div>
```

```
<nav className="flex items-center gap-1 bg-slate-800 p-1 rounded-lg border border-slate-700">
```

```
  <button
```

```
    onClick={() => setMode(AppMode.ANALYSIS)}
```

```
    className={`px-4 py-2 rounded-md text-sm font-medium transition-all flex items-center gap-2 ${
```

```
      mode === AppMode.ANALYSIS
```

```
        ? 'bg-slate-700 text-white shadow-sm'
```

```
        : 'text-slate-400 hover:text-slate-200'
```

```
    ]}
```

```
>
```

```
  <Activity className="w-4 h-4" />
```

```
    Live Analysis
```

```
</button>
```

```
<button
```

```

        onClick={() => setMode(AppMode.REPORT)}

        className={`px-4 py-2 rounded-md text-sm font-medium transition-all flex items-
center gap-2 ${
        mode === AppMode.REPORT
        ? 'bg-slate-700 text-white shadow-sm'
        : 'text-slate-400 hover:text-slate-200'
        }}
    >
    <FileText className="w-4 h-4" />
    Model Report
</button>
</nav>
</div>
</header>

{/* Main Content */}
<main className="max-w-7xl mx-auto px-4 sm:px-6 lg:px-8 py-8 animate-fade-in">
    {mode === AppMode.ANALYSIS ? (
        <div className="space-y-6">
            <div className="text-center max-w-2xl mx-auto mb-10">
                <h2 className="text-3xl font-bold text-white mb-3">Microscopic Cell
Classification</h2>
                <p className="text-slate-400">
                    Upload thin blood smear images to detect Plasmodium-infected red blood cells
using our Gemini-powered inference engine.
                </p>
            </div>
        </div>
    )}

```

```
<ImageAnalyzer />
</div>
): (
<div className="space-y-6">
  <div className="flex items-center justify-between mb-8">
    <div>
      <h2 className="text-3xl font-bold text-white mb-2">CNN Architecture &
Performance</h2>
      <p className="text-slate-400">Design, train (simulated), and evaluate custom
CNN models on the Malaria Cell Images dataset.</p>
    </div>
    <div className="hidden lg:block text-right">
      <p className="text-xs text-slate-500 uppercase tracking-wider">Dataset
Source</p>
      <a href="https://www.kaggle.com/datasets/iarunava/cell-images-for-detecting-
malaria" target="_blank" rel="nofollow" className="text-blue-400 hover:text-blue-300 text-sm font-
medium">Kaggle Malaria Dataset ↗ </a>
    </div>
  </div>
</div>
<ReportGenerator />
</div>
)}
</main>

{/* Footer */}
<footer className="border-t border-slate-800 mt-12 py-8 text-center text-slate-500 text-sm">
  <p>© 2024 20237117 하은희. Powered by Google Gemini 2.5 Flash & 3 Pro Preview.</p>
</footer>
```

```
</div>
```

```
);
```

```
};
```

```
export default App;
```